WHAT IS CLAIMED IS:

1. A display device comprising:

a light source device that includes first to fourth solid-state light sources that emit first to fourth illumination lights, respectively;

a spatial light modulator that modulates the first to the fourth illumination lights; and

a controller that controls operation of the light source device to allow the first and the second illumination lights to time-sequentially enter an identical illumination area of the spatial light modulator, and to allow the third and the fourth illumination lights to individually enter the spatial light modulator so as to avoid the third and the fourth illumination lights from being superposed on the first and the second illumination lights.

2. The display device according to claim 1, wherein the spatial light modulator includes

a first spatial-light modulating device that corresponds to the first and the second illumination lights;

a second spatial-light modulating device that corresponds to the third illumination light; and

a third spatial-light modulating device that corresponds to the fourth illumination light, and

the controller allows the third and the fourth illumination lights to enter the second and the third spatial-light modulating devices, respectively, and allows the first and the second illumination lights to

time-sequentially enter the identical illumination area of the first spatial-light modulating device.

3. The display device according to claim 2, wherein the first and the second illumination lights have peak wavelengths that are mutually approximate to each other, and the third and the fourth illumination lights have respective peak wavelengths that are apart from the peak wavelengths of the first and the second illumination lights.

4. The display device according to claim 1, further comprising:

a wave combining unit that, when the first and the second illumination lights are incident on the wave combining unit, combines the first and the second illumination lights makes the combined illumination light to enter the spatial light modulator; and

a polarization converter that converts either one of the first and the second illumination lights to a linearly polarized light in a predetermined direction to allow the polarized light converted to enter the wave combining unit.

5. The display device according to claim 4, wherein

the wave combining unit is a light combining element that uses transmission and reflection of light, and

a peak wavelength of the one illumination light is set in a difference generation range that is between a first edge wavelength of the linearly polarized light in the predetermined direction in the light

combining element and a second edge wavelength of a linearly polarized light in a direction perpendicular to the predetermined direction of the light combining element.

6. The display device according to claim 1, wherein the spatial light modulator further includes a single spatial-light modulating device which all the first to the fourth illumination lights enter, wherein

the controller allows the first to the fourth illumination lights to time-sequentially enter an identical illumination area of the single spatial-light modulating device.

7. The display device according to claim 1, wherein a total illumination time of the first and the second illumination lights in one frame is equal to each illumination time of the third and the fourth illumination lights, and intensity of the first and the second illumination lights is relatively higher than intensity of the third and the fourth illumination lights.

8. The display device according to claim 1, wherein the controller allows the first and the second illumination lights to time-sequentially enter the identical illumination area of the spatial light modulator at a predetermined intensity ratio corresponding to a color tone or a white level of an image.

9. The display device according to claim 1, wherein the controller

allows the first and the second illumination lights to respectively enter the spatial light modulator in each illumination time of two periods into which a frame time is divided and at an intensity twice as high as an intensity of illumination light that is the first illumination light singly used.

10. The display device according to claim 1, wherein the controller allows the first and the second illumination lights to time-sequentially enter the identical illumination area of the spatial light modulator at a predetermined time ratio corresponding to a color tone or a white level of an image.

11. A projector comprising:

a display device that includes

a light source device that includes first to fourth solid-state light sources that emit first to fourth illumination lights, respectively;

a spatial light modulator that modulates the first to the fourth illumination lights; and

a controller that controls operation of the light source device to allow the first and the second illumination lights to time-sequentially enter an identical illumination area of the spatial light modulator, and to allow the third and the fourth illumination lights to individually enter the spatial light modulator so as to avoid the third and the fourth illumination lights from being superposed on the first and the

second illumination lights; and

a projection optical system that projects an image of the spatial light modulator.

12. A lighting device comprising:

a light source device that includes first and second light sources that emit first and second illumination lights, respectively, each of which has a peak wavelength different from each other;

a wave combining unit that combines the first and the second illumination lights when the first and the second illumination lights are incident on the wave combining unit, and emits illumination lights combined; and

a polarization converter that converts the second illumination light to a linearly polarized light in a predetermined direction to allow it to enter the wave combining unit.

13. The lighting device according to claim 12, wherein

the wave combining unit is a light combining element that uses transmission and reflection of light, and

a peak wavelength of the one illumination light is set in a difference generation range that is between a first edge wavelength of the linearly polarized light in the predetermined direction in the light combining element and a second edge wavelength of a linearly polarized light in a direction perpendicular to the predetermined direction of the light combining element.

14. The lighting device according to claim 13, wherein a central wavelength of the first illumination light is set in a range outside the difference generation range yet close to the difference generation range.

15. The lighting device according to claim 12, wherein the wave combining unit is a dichroic mirror.

16. The lighting device according to claim 12, wherein the first and the second light sources are solid-state light sources.

17. The lighting device according to claim 12, wherein the polarization converter includes

a rod integrator on which light emitted from the second illumination light is incident;

a reflection-type polarizing plate that is provided at an emission end of the rod integrator; and

a reflecting unit that returns a light, having passed through the rod integrator and being returned from the reflection-type polarizing plate, to an incidence end of the rod integrator.

18. The lighting device according to claim 12, wherein the polarization converter includes

a pair of polarization beam splitters on which lights emitted from

the second light source are sequentially incident; and

a waveplate that is provided at an emission side of the polarization beam splitter in a subsequent stage.

19. The lighting device according to claim 12, wherein both of the first and the second illumination lights belong to any one of three primary colors.

20. A projector comprising:

a lighting device that includes

a light source device that includes first and second light sources that emit first and second illumination lights, respectively, each of which has a peak wavelength different from each other;

a wave combining unit that combines the first and the second illumination lights when the first and the second illumination lights are incident on the wave combining unit, and emits illumination lights combined; and

a polarization converter that converts the second illumination light to a linearly polarized light in a predetermined direction to allow it to enter the wave combining unit;

a spatial-light modulating device illuminated by the lighting device; and

a projection lens that projects an image of the spatial-light modulating device.

21. The projector according to claim 20, wherein

the lighting device further includes

third and fourth light sources that emit third and fourth illumination lights, respectively, each of which belongs to one of three primary colors, that is different from a primary color thereof to which the first and the second illumination lights belong,

the spatial-light modulating device further includes

three spatial-light modulating devices that individually modulate the first and the second illumination lights, the third illumination light, and the fourth illumination light when the first and the second illumination lights, the third illumination light, and the fourth illumination light are incident thereon, respectively; and

a light combining member that combines the illumination lights modulated from the spatial-light modulating devices to be emitted, and

the projection lens projects images of the three spatial-light modulating devices, the images being combined through the light combining member.

22. The projector according to claim 20, wherein the spatial-light modulating device is a liquid-crystal light valve.

23. A lighting device comprising:

a light source unit that includes at least two light sources of a first light source that supplies a first illumination light and a second light

source that supplies a second illumination light having a wavelength range different from that of the first illumination light; and

a wave combining unit that combines the first illumination light and the second illumination light both of which are traveling from different directions, and emits the illumination lights combined,

wherein the light source unit and the wave combining unit are arranged so that an angle of the first illumination light incident on the wave combining unit and an angle of the second illumination light incident on the wave combining unit are substantially the same as each other, and are less than 45°.

24. The lighting device according to claim 23, wherein

the light source unit further includes at least one third light source that supplies a third illumination light having a wavelength range different from the wavelength ranges of the first illumination light and the second illumination light,

the wave combining unit includes at least two wave combining elements of a first wave combining element that combines the first illumination light with the second illumination light to emit the illumination lights combined, and a second wave combining element that combines the illumination lights combined emitted from the first wave combining element with the third illumination light to be emitted, and

the third light source and the second wave combining element are arranged so that an angle of the third illumination light incident on

the second wave combining element and an angle of the illumination lights combined incident on the second wave combining element are substantially the same as each other, and are less than 45°.

25. The lighting device according to claim 23, wherein

the wave combining unit is a light combining element that uses transmitting action and reflecting action of light,

the light combining element has a first edge wavelength and a second edge wavelength that are different from each other, the first edge wavelength being in a wavelength range where transmittance characteristic or reflectance characteristic for a linearly polarized light in a predetermined direction of vibration is switched, and the second edge wavelength being in a wavelength range where transmittance characteristic or reflectance characteristic for a linearly polarized light in a direction of vibration substantially perpendicular to the predetermined direction of vibration is switched, and

wherein the lighting device further comprises:

a polarization converter that converts at least one of the first illumination light and the second illumination light to a linearly polarized light in the predetermined direction of vibration or to a linearly polarized light in a direction of vibration substantially perpendicular to the predetermined direction of vibration, wherein at least a part of the wavelength range of the first illumination light or of the second illumination light is superimposed on a wavelength range between the first edge wavelength and the second edge wavelength.

26. A projector comprising:

a lighting device including

a light source unit that includes at least two light sources of a first light source that supplies a first illumination light and a second light source that supplies a second illumination light having a wavelength range different from that of the first illumination light; and

a wave combining unit that combines the first illumination light and the second illumination light both of which are traveling from different directions to emit the illumination lights combined;

a spatial-light modulating device that modulates the illumination lights from the lighting device according to an image signal; and

a projection lens that projects the illumination lights modulated,

wherein the light source unit and the wave combining unit are arranged so that an angle of the first illumination light incident on the wave combining unit and an angle of the second illumination light incident on the wave combining unit are substantially the same as each other, and are less than 45°.